1. A method of fabricating a semiconductor device, comprising:

depositing a first material on a surface, the first material having a first etch rate;

forming a trench through the first material and into the surface; and

depositing a trench filler material in the trench, the trench filler material having an etch rate that is substantially similar to or less than the first etch rate.

2. The method of claim 1, including removing the first material.

3. The method of claim 2, including depositing at least a portion of a sacrificial layer of a second material on the trench filler material and the surface.

4. The method of claim 3, including annealing the sacrificial layer.

5. The method of claim 4, wherein said annealing step forms a thermally grown portion of said sacrificial layer.

6. The method of claim 3, including implanting a dopant into the substrate through the sacrificial layer and removing the sacrificial layer.

7. The method of claim 3, including forming a sacrificial layer by deposition and thermal growth.

8. The method of claim 2, including depositing a sacrificial layer of a second material on the trench filler material, the second material having an etch rate substantially similar to or less than the etch rate of the trench filler material.

9. The method of claim 8, including annealing the sacrificial layer.

10. The method of claim 1 wherein the first material includes an oxide.

11. The method of claim 10 wherein the first material includes silicon dioxide deposited from tetraethylorthosilicate or a silane and oxygen system.

12. The method of claim 10 wherein the first material is deposited by chemical vapor deposition.

13. The method of claim 9 wherein the trench filler material includes an oxide.

14. The method of claim 13 wherein the trench filler material is deposited by chemical vapor deposition.

15. The method of claim 8 wherein the first material, the second material and the trench filler material are silicon dioxide.

16. A method of providing a sacrificial layer on a semiconductor structure having a trench structure filled with a trench filler material, comprising:

depositing a layer of a first material over the trench filler material and the structure; and

annealing the layer.

17. The method of claim 16 wherein the etch rates of said trench filler material and said first material are substantially similar.

18. The method of claim 17 wherein both the first material and the trench filler material include silicon dioxide.

19. The method of claim 18 wherein the silicon dioxide is deposited from tetraethylorthosilicate or a silane and oxygen system.

20. The method of claim 18 wherein the silicon dioxide is deposited by chemical vapor deposition.

21. The method of claim 16, including implanting a dopant into the substrate through the sacrificial layer.

22. The method of claim 16, including growing an oxide layer.

23. The method of claim 22, wherein said oxide layer is grown during said annealing step.

24. The method of claim 22, wherein said oxide layer is grown before said first layer is deposited.

25. The method of claim 22, wherein said oxide layer is grown after said first layer is deposited.

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26. A semiconductor structure, comprising:

a support;

a first material deposited on said support, the first material having a first etch rate;

a trench formed through the first material and into the support; and

a trench filler material deposited in the trench, the trench filler material having an etch rate that is substantially similar to or less than the first etch rate.

27. The semiconductor device of claim 26, wherein the first material includes silicon dioxide deposited from tetraethylorthosilicate or a silane and oxygen system.

28. The semiconductor device of claim 26, wherein the first material includes silicon dioxide deposited by chemical vapor deposition.

29. The semiconductor device of claim 26, wherein the trench filler material includes silicon dioxide deposited from tetraethylorthosilicate or a silane and oxygen system.

30. The semiconductor device of claim 26, wherein the trench filler material includes silicon dioxide deposited by chemical vapor deposition.

Subt B

31. A semiconductor structure having a trench, comprising:

a trench filler material that fills the trench; and

at least a portion of a second material deposited on the trench filler material and the structure,

wherein the second material is annealed.

32. The semiconductor device of claim 31, wherein the etch rate of the second material is substantially similar to or less than the etch rate of the first material.

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33. The semiconductor device of claim 32, wherein both the second material and the trench filler material include silicon dioxide.

34. The semiconductor device of claim 31, wherein a portion of said second material is thermally grown.

35. A method of forming trench isolation structures in semiconductor devices comprising:

forming a layer on a semiconductor member;

forming a trench through said layer and into said member;

filling said trench with a trench filling material; and

etching said trench filling material and removing said layer without forming grooves in the remaining trench filling material.